Ankersmid Sampling

Ankersmid Sampling

User Manual

Portable Gas Conditioning System

Series APS

Portable Gas Conditioning System

Series APS 30x, 31x

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Technical Details Subject to Change

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B. Used terms and signal indications

QUALIFIED PERSONNEL	Persons with necessary qualification, who are familiar with installation use and maintenance of the product
NOTE	The signal is used according to DIN 4844 and EU Recommendation 91/C53/06
IMPORTANT	Important information about the product or parts referring to operating in hazardous areas

C. Electrical standards

CE – Certification

The product described in this operating manual complies with following EC directives:

EMV-Instruction

The requirements of the EC directive 89/336/EWG "Electromagnetic compatibility" are met.

Low Voltage Directive

This product corresponds to the electrical standard of safety regulations concerning the low-voltage of the EC recommendation **73/23 EEC** and the **recommendation of electromagnetic compatibility 89/336 EEC**.

Declaration of conformity

The EU Declaration of conformity is available at Ankersmid Sampling.

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D. Safety instructions

Please read these operating instructions very carefully before start up and use of the equipment.

- Please check before installing the equipment if the device is suitable for:
- the exposed pressure
- the exposed temperature
- the exposed ambient conditions (e.g.: rain, moist, dust,…)

- Attention must be paid to the requirements of **IEC 364 (DIN VDE 0100)** when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

- Work on electrical equipment should only be carried out by trained specialists.

- Before connecting the equipment, be sure that the main voltage is equal to the voltage mentioned on the type plate on the inside of he electrical box.

- Beware that the apparatus and the control units are switched off before opening of the protection body.

- Installation, maintenance, monitoring and repairs can be done by authorised personnel.

IMPORTANT:
This equipment is, in its standard version, not explosion-proofed!

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E. Warranty

If the equipment fails, please contact your ANKERSMID SAMPLING dealer.
The warranty is covered for a period of 1 year countable from the first day of delivery (as also specified in our normal terms and conditions of sale) when the apparatus (*) is handled and assembled correctly, installed according good craftsmanship, treatment and use or operation of the equipment.

The warranty covers repair at the factory at no cost, or the replacement at no cost of the equipment free ex user location. In case of resend or reshipment, the probe must be properly packed or in his original protective packaging or in a sufficient adapted recipient.

NOTE

Consumables are only covered by this warranty in case of production defaults.

F. Introduction

ANKERSMID SAMPLING Portable gas conditioning systems are used in mobile gas analysis to prepare a sample gas by filtering the gas according to any dust particles and by lowering the dew point of humid gas to avoid condensate in the analyser. A good and stable gas dew point avoids cross-interference if the analyser is sensitive to H2O.

F.1 Serial number

The serial number is mentioned on the type plate on the device.

F.2 Power supply

Depending on the country area the device is available for a power supply of 230V/50Hz or 115V/60Hz.

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G. Description

The portable conditioning systems are developed, designed, patented and assembled by Ankersmid Sampling in Belgium.

The temperature of this Peltier cooler unit is regulated by an electronic device with a standard setting of 4°C.

The temperature regulation unit offers the possibility to bring out alarm or fault contacts.

In option a 2-way Modbus / RS485 communication is possible; this combines all Ankersmid controllers, so that digital communication with the control room is possible.

The content and use of a portable system is shown in below standard flow chart, marked with a dashed frame:

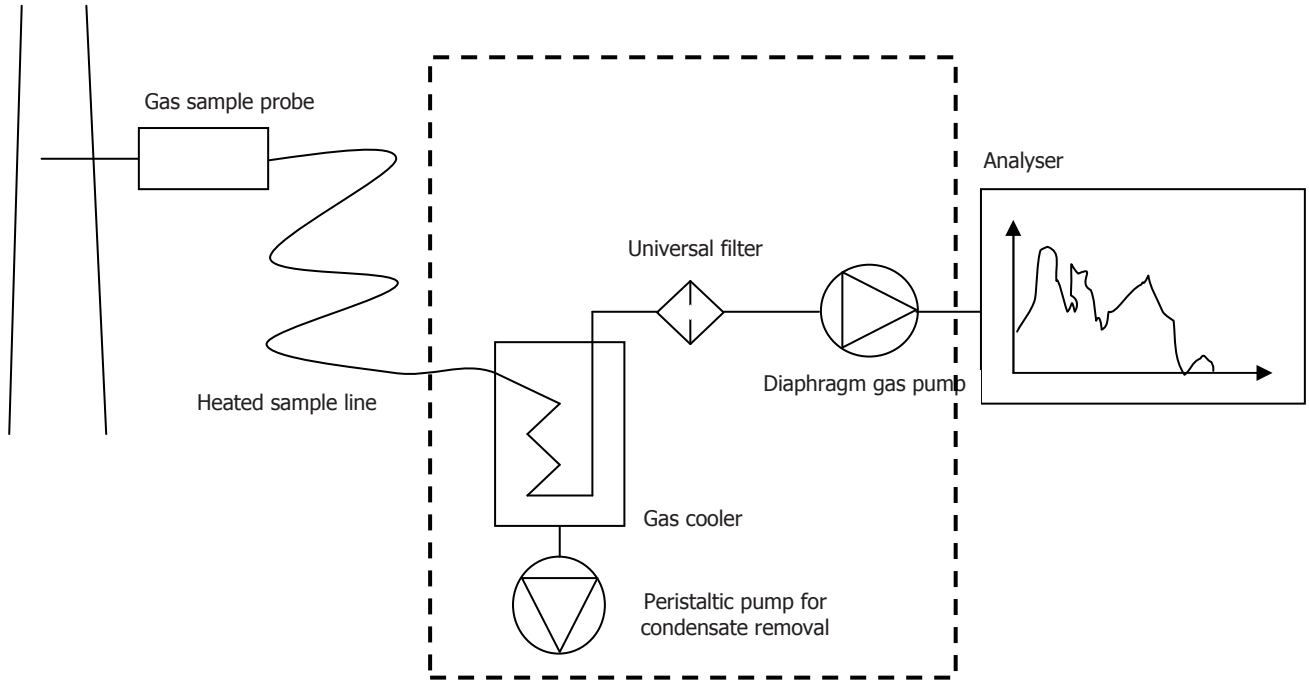

Figure 1 Standard flow chart of a gas sampling line

The standard exchanger, made of Duran glass with a PTFE screwed head, is cooled by a complete system of a Peltier element, a cooling block, a heat sink, and a ventilator.

By lowering the temperature of the sample gasses, condensate liquid will be formed on the sides of the exchanger. Condense drops will form and descend to the bottom of the vessel. This condensate liquid will be removed by a peristaltic pump which is mounted inside the portable case.

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H. Technical data

APS Portable system	APS 301	APS 302	APS 303	APS 311	APS 312	APS 313
Gas flow rate max.	350Nl/h	350Nl/h	350Nl/h	150Nl/h	150Nl/h	150Nl/h
Sample outlet dew point	+1°C ..... +15°C, factory setting: +4°C					
Dew point stability	±0,1°C					
Sample inlet temperature	Max.190°C					
Sample inlet connection	Stainless steel connection DN4/6mm, suitable for heated sample lines					
Sample inlet dew point	Max. 80°C					
Ambient temperature	+5°C up to +45°C					
Maximum pressure	3 bar abs.					
Material of gas wetted parts*						
Heat exchanger head	PTFE	PVDF	SS316	PTFE	PVDF	SS316
Heat exchanger body	Glass	PVDF	SS316	Glass	PVDF	SS316
Diaphragm pump	Head: PPS, Valves: FFPM, Membrane: PTFE-coated					
Filter	head, filter element, element holder: PTFE, body: glass					
Peristaltic pump	Tube: Novoprene®, Connectors: PVDF					
Others	Tubing: PTFE, Inlet connector: SS316, Outlet connector: PVDF					
Number of gas inlets	1					
Number of gas outlets	1 (standard), max. 2					
Filter porosity*	2µm					
Alarm contact	Free programmable contact 1NO / 1NC, rating: 250V, 16A AC					
Total cooling capacity	Max. 225kJ/h			Max. 215kJ/h		
Storage temperature	-25 °C up to +65 °C					
Ready for operation	< 15 min					
Power supply	230V/50Hz or 115V/60Hz					
Power consumption	100VA					
Electrical connection	Cold appliance plug with 1,5 m of cable					
Housing	Portable plastic case					
Housing dimensions	52,4mm x 42,8mm x 20,6mm (W x H x D)					
Electrical protection	Fuse 2A					
Electrical standard	EN61010					
Weight approx.	12 kg					

*Maximum values in technical data's must be rated in consideration of total cooling capacity at 25°C ambient temperature and 4°C outlet dew point
PTFE = Polytetrafluoroethylene (Teflon®)
PVDF = Polyvinylidenfluoride
PPS = Polypropylenesulphide (Ryton®)
FFPM = Perfluorelastomer (Kalrez®)

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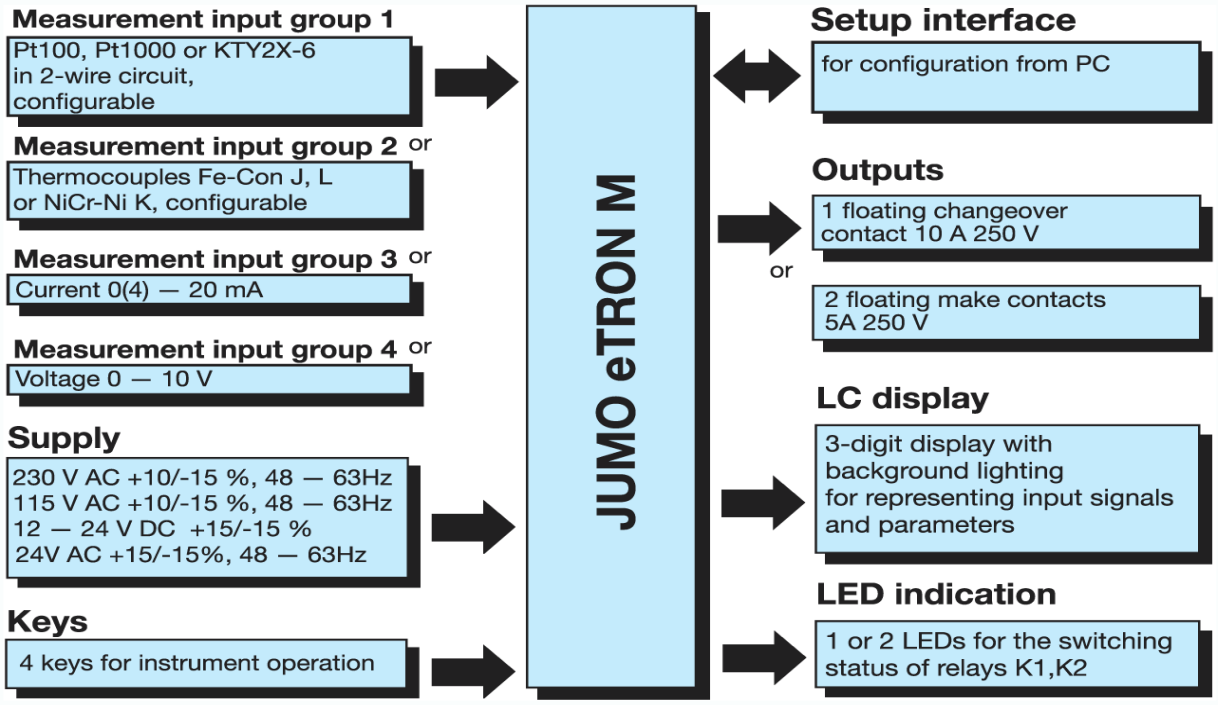
I. Regulation device

The JUMO eTRON M is a compact, digital electronic thermostat for simple temperature control (heating or cooling). The measurement input permits the connection of resistance thermometers or thermocouples, or standard current or voltage signals. The measured value is shown on a 3-digit backlit display. The switching states of relays K1 and K2 are indicated by two LEDs.
The instrument incorporates a simple defrosting function as well as an operating hours counter, which can, for instance, be used to record the operating time of a cooling compressor.
The instrument can be operated from 4 keys on the front panel. The electrical connection is made via screw terminals on the back of the instrument.
A setup program and a PC interface are available as accessories, for simple configuration and parameterization from a PC.

Block structure


Measurement input group 1
Pt100, Pt1000 or KTY2X-6 in 2-wire circuit, configurable
Measurement input group 2 or
Thermocouples Fe-Con J, L or NiCr-Ni K, configurable
Measurement input group 3 or
Current 0(4) — 20 mA
Measurement input group 4 or
Voltage 0 — 10 V
Supply
230 V AC +10/-15 %, 48 — 63Hz
115 V AC +10/-15 %, 48 — 63Hz
12 — 24 V DC +15/-15 %
24V AC +15/-15%, 48 — 63Hz
Keys
4 keys for instrument operation
JUMO eTRON M
Setup interface
for configuration from PC
Outputs
1 floating changeover contact 10 A 250 V
or
2 floating make contacts 5A 250 V
LC display
3-digit display with background lighting for representing input signals and parameters
LED indication
1 or 2 LEDs for the switching status of relays K1,K2

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The display of the regulation unit will directly indicate the temperature in real time.
The setting temperature is set by our manufacturing department.

Settings (alarm etc.) can be done according as follows:

4 Commissioning the instrument

4.1 Displays and controls

LC display	3-digit 9-segment display, 13 mm high, and symbols for the temperature unit, h, min, s, defrosting and heating, with red background lighting.
LED K1, K2	LED K1/K2 lights up when relay K1/K2 is energized. LED K1/K2 goes out when relay K1/K2 is de-energized.
Keys	▶ for start-stop in heating and cooling operation P programming ▲ increase value select operational status in enabling level ▼ decrease value select operational status in enabling level
Setup interface	The instrument is linked to the PC via a PC interface with TTL/RS232 converter and adapter (3 pins).

✱ Connect supply voltage – all segments light up twice as a test (segment test).
When everything has been connected up correctly on the instrument, the present process value will be shown.
If an alarm message appears, see Chapter 7 "Alarm messages".
The relay operates according to the controller type that was set, see Chapter 4.2 "Setting the instrument functions (parameter level)".

4.2 Setting the instrument functions (parameter level)

☞ Time-out:
If no key is pressed for 60 seconds, the instrument automatically switches back to the process value display, see *Overview of operation* on the front inside page.

The instrument functions and values are set at the parameter level.

✱ Press the P key for 3 seconds and Cod 0 will appear alternately.

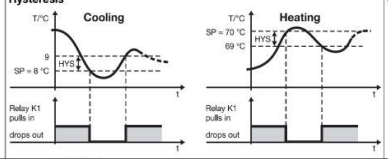
✱ Set code 72 for accessing the parameter level by using the ▲ and ▼ keys.
The longer the key is pressed, the faster the value will change.

✱ Acknowledge with P,
parameter name and **value** appear alternately, e.g. SP 0.0.

✱ Use the ▲ and ▼ keys to set the value within the specified value range.
✱ Acknowledge setting with P.
✱ Set next parameter, see *Overview of operation* on the front inside page.

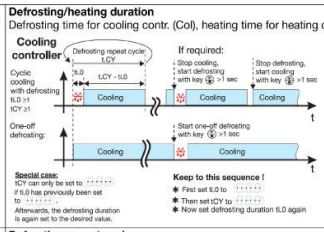
☞ **Switching parameters out of display:**
The table below lists all parameters for each instrument type.
Depending on the type designation on the nameplate, parameters which are not required can be hidden.

Controller

Parameter	Meaning	Value range from...**factory-set**...to
SP	**Setpoint** target value of control action (temperature value, current or voltage)	SP.L ... **0.0** ... SP.H
HYS	**Hysteresis** 	0.2 ... **1.0** ... 99.9
SP.L	**Low setpoint limit** SP can be set down to this low limit.	-999 ... **-50** ... +999
SP.H	**High setpoint limit** SP can be set up to this high limit.	-999 ... **500** ... +999
tYP	**Controller type** CoL : cooling controller Hot : heating controller	**Hot**, CoL
dLY	**Switch-on delay after power-on** for staggered switch-on of several equipment units in a plant.	**0** ... 60 min

Parameter	Meaning		Value range from...**factory-set**...to
t.On	**Minimum ON time**	Here you can set the minimum time for which the equipment unit, for instance, has to remain switched on or off. These values depend on the heating or cooling unit used (observe manufacturer's specifications). In the event of a **probe error,** the relay is operated immediately as set in parameter S.Er.	**0** ... 999 s
t.OF	**Minimum OFF time**		**0** ... 999 s

Timer

t.tO	**Defrosting/heating duration** Defrosting time for cooling contr. (Col), heating time for heating contr. (Hot). 	----, 1 ... 999 min The 6 dots mean: no time limit. This is shown instead of the value "0". factory-set: ----
t.CY	**Defrosting repeat cycle** only with the "cooling controller" setting (Col)	1 ... **24** ... 999 h ---- [1]

Cooling controller
Defrosting repeat cycle: t.CY
If required:
Stop cooling, start defrosting with key ▶ >1 sec
Stop defrosting, start cooling with key ▶ >1 sec
Cyclic cooling with defrosting
tI.0 >1
tCY >1
tI.0
t.CY - tI.0
Cooling
Cooling
Cooling
t
One-off defrosting:
Start one-off defrosting with key ▶ >1 sec
Cooling
Cooling
t
Special case:
tCY can only be set to ------
if tI.0 has previously been set to ------.
Afterwards, the defrosting duration is again set to the desired value.
Keep to this sequence !
✱ First set tI.0 to ------
✱ Then set tCY to ------
✱ Now set defrosting duration tI.0 again

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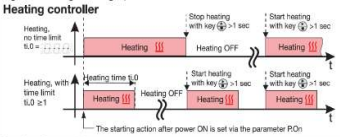
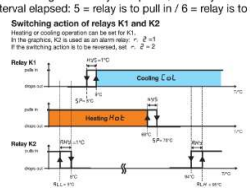
Parameter	Meaning	Value range from...factory-set...to
t. i	**Currently remaining running time** e.g. for cooling/heating operation etc. **Heating controller**  	999h ... 2h, 120min ... 2min, 120s ... 0s, With setting - - - - - -, t. i cannot be edited
t.S i	**Service interval** The time period after which the equipment unit has to be serviced is set here. The active relay time is taken into account.	**0** ... 999h ... 9.9t h
t. S	**Current service counter for equipment unit connected** This shows how much time has elapsed since the last service. On reaching the interval t.S i, an alarm message is generated. If the counter is reset after a service, the alarm message disappears.	**0** ... 999h ... 9.9t h
t. h	**Display of the total operating hours** Active time of relay for maintenance of heating or cooling units.	**0** ... 999h ... 9.9t h
d iS	**Temperature display during defrosting** Freeze temperature value during defrosting: 0 Update temperature value continuously: 1	0, **1**

Parameter	Meaning	Value range from...factory-set...to
Alarms		
AL.L	**Low alarm limit** [1] If the process value falls below this limit during heating or cooling operation, the alarm message AL.L is output to the display, see Chapter 7 "Alarm messages". If r 2= 1 or 2, relay K2 will also switch.	-999 ... **-200** ... +999
AL.H	**High alarm limit** [1] If the process value goes above this limit during heating or cooling operation, the alarm message AL.H is output to the display, see Chapter 7 "Alarm messages". If r 2= 1 or 2, relay K2 will also switch.	-999 ... **500** ... +999
A.HY	**Alarm hysteresis** The hysteresis that was set is below AL.H or above AL.L.	0.2 ... **1.0** ... 99.9
AL.d	**Alarm suppression time** [1] An alarm from AL.L or AL.H is not displayed for this time. If the alarm is present for longer than AL.d, then it will be displayed. Also the switching action of relay K2 will depend on the supression time, if parameter r.2 is set to 1 or 2 (alarm message).	**0** ... 60 min

1.) During defrosting ❄ and also during heating OFF (symbol for heating has gone out), alarm monitoring is inactive.

S.Er	**Response to over/underrange** 0: relay 1 drops out at once / relay 2 drops out at once 1: relay 1 pulls in at once / relay 2 drops out at once 2: relay 1 drops out at once / relay 2 pulls in at once 3: relay 1 pulls in at once / relay 2 pulls in at once	**0**...3

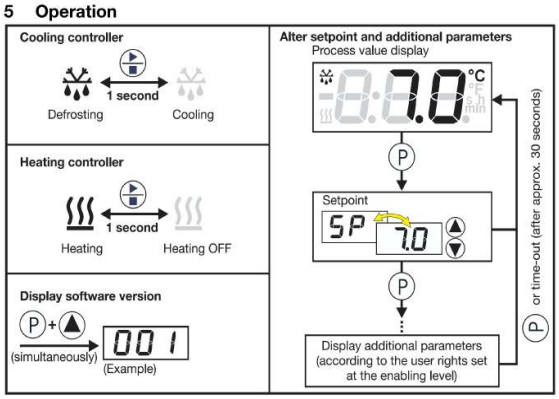
Parameter	Meaning	Value range from...factory-set...to
P.On	**Response after power-on** 0: Defrosting / Heating OFF 1: Cooling / Heating	0, **1**
btn	**Enabling the start-stop key** (P) 0: inhibited 2: acknowledgement for relay 2 (K2) 1: enabled 3: start/stop enabled and acknowledgement relay 2	0, **1**, 2, 3
r. 2	**Function of relay K2** No function: 0 Signal alarm message: 1 = relay is to pull in, 2 = relay is to drop out Output timer message : 3 = relay is to pull in, 4 = relay is to drop out Service interval elapsed: 5 = relay is to pull in / 6 = relay is to drop out **Switching action of relays K1 and K2**  	**0** ... 6

Parameter	Meaning	Value range from...factory-set...to
Input		
SEn	Sensor connected in 2-wire circuit Measurement input group 1 on Type: 701060/X1X-XX	**Pt100:** P.1h Pt1000: P.1E KTY2X-6: PtC or tAb
	Measurement input group 2 on Type: 701060/X2X-XX	Fe-Con J: tcJ Fe-Con L: tcL NiCr-Ni K: tcH or tAb
	Measurement input group 3 on Type: 701060/X3X-XX	0(4)... 20 mA: Lin / tAb
	Measurement input group 4 on Type: 701060/X4X-XX	0 ... 10 V: Lin / tAb
S.cL	**Start value** for indication range with measurement input voltage or current Example: input signal (e.g. 4 to 20mA) is to be represented in the display from -10 to 50. Set S.cL= -10 and S.cH=50.	-999 ... **0**... +999
S.cH	**End value** for indication range with measurement input voltage or current	-999 ... **100**... +999
i. 0	**Signal** for measurement input current: 0 = 0 to 20mA 1 = 4 to 20mA	**0**, 1
OF.t	**Process value offset** PV offset in °C, °F or digit (no unit)	-99.9 ... **0.0** ... 99.9

Parameter	Meaning	Value range from...factory-set...to
OF.r	**Lead compensation resistance** This value is used to compensate the resistance of the probe lead for resistance sensors and is dependent on the lead length. For best temperature measurement results, the resistance value of the probe lead has to be entered here. ☝ If the total resistance at the measurement input (sensor resistance + selected value for OF.r) exceeds 320 Ω with Pt100 or 3200 Ω with Pt1000/KTY2x-6, a measurement error will occur !	0.0 ... **0.0** ... 99.9 Ω
Un i	**Unit** for the process value displayed ☝ For settings in °F, the process value will be converted correspondingly. All other settings, such as for SP, will retain their values.	**°C**, °F or no (= no unit)
dF	**Filter time constant** for adapting the digital input filter. At a signal step, 63 % of the changes are registered after the filter time constant has elapsed. Values between 0.1 and 0.7 are interpreted as 0.8 (sampling time). If the filter time constant is long: - high damping of interference signals - slow reaction of the process value display to process value changes	0.1 ... **0.8** ... 99.9 s

☞ Return to the first parameter SP of the parameter level with (P) > 3 seconds.

5 Operation



4.3 Allocating user rights (enabling level)

The setting at the enabling level defines **user rights** which determine whether a parameter is shown at the operating level, can be edited or is not shown at all.

* Press (P) for 3 seconds and Cod 0 appears.
* Set code 82 for accessing the enabling level using the (▲) and (▼) keys.
* Acknowledge with (P)
  Parameter and **User right** blink in alternation, e. g. SP Ed i.
* Use the (▲) and (▼) keys to set user right to Ed i, rd or no.

User right	Display	Factory setting
Parameter is **shown and editable** at the operating level	Ed i	SP
Parameter is **shown only** at the operating level	rd	-
Parameter is **not shown** at the operating level	no	all other parameters

* Acknowledge settings with (P).
* Set next parameter, see *Overview of operation* on the front inside page.

7 Alarm messages

The following alarm messages may appear in the temperature display:

Error message	Cause	Elimination
Err 888	**Display overrun** The measured value is too large and outside the range.	- Check sensor and connecting cable for damage or short-circuit - Check whether the correct sensor has been set or connected ⇨ Chapter 4 "Commissioning the instrument" ☞ These messages are only output to the process value display.
Err -888	**Display underrun** The measured value is too small and outside the range.	
t. S ProcVal -10.5	**Service interval** elapsed The time that was set for the maintenance of a heating or cooling unit has elapsed.	* Carry out service * At the parameter level, reset t. S manually to 0 ⇨ Chapter 4 "Commissioning the instrument"
dLY ProcVal -10.5	Time for **switch-on delay** after power-on has elapsed. With display over/underrun, the switch-on delay becomes ineffective.	* Cancel switch-on delay with (P) + (▼)
AL.L ProcVal -10.5	Value has fallen below the **low alarm limit**	* Depending on the controller type, check whether the heating or cooling unit is still functioning faultlessly.
AL.H ProcVal 99.5	Value has gone above the **high alarm limit**	* Check whether any relay fuse that may have been installed is still in good working order. The alarm disappears as soon as PV goes above or below the AL limits by the amount of the hysteresis.

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Technical Details Subject to Change

J. Versions, options, consumable and spare parts

APS 301	Portable gas conditioning system for 350Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of Duran® Glass (body) and PTFE (head), universal filter AUF 102, diaphragm pump AMP 11E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 302	Portable gas conditioning system for 350Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of PVDF (body and head), universal filter AUF 102, diaphragm pump AMP 11E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 303	Portable gas conditioning system for 350Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of Stainless Steel 316 (body and head), universal filter AUF 102, diaphragm pump AMP 11E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 311	Portable gas conditioning system for 200Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of Duran® Glass (body) and PTFE (head), universal filter AUF 102, diaphragm pump AMP 26E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 312	Portable gas conditioning system for 200Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of PVDF (body and head), universal filter AUF 102, diaphragm pump AMP 26E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 313	Portable gas conditioning system for 200Nl/h. In an heavy duty ABS portable housing, consisting of: Peltier cooler with exchanger made of Stainless Steel 316 (body and head), universal filter AUF 102, diaphragm pump AMP 26E, peristaltic pump ACP 001, Pre-filter type APS 900 (25µm) to protect peristaltic pump. Internal tubing: PTFE. Power: 230V/50Hz
APS 001	Option for APS/ASS 3xx with flow meter (max. 2 pcs.). Material: acylic glass. Range: 0,1-1,2 Nl/min
APS 002	Option for APS/ASS 3xx with flow meter (max. 2 pcs.). Material: acylic glass. Range: 0,5-2,5 Nl/min
APS 003	Option for APS/ASS 3xx with flow meter (max. 2 pcs.). Material: acylic glass. Range: 0,5-6 Nl/min
APS 004	Option for APS/ASS 3xx with flow meter (max. 2 pcs.). Material: acylic glass. Range: 2-14 Nl/min
APS 005	Option for APS/ASS 3xx with flow meter (max. 2 pcs.). Material: acylic glass. Range: 5-30 Nl/min
APS 006	Option for APS/ASS 3xx with liquid alarm unit in APS 30x. Consisting of: filter unit AUF 104 (instead of AUF 102) with drain, Liquid alarm ALA 002, ALA 102 Electronic device. Automatic switch off of sample pump at condensate inrush

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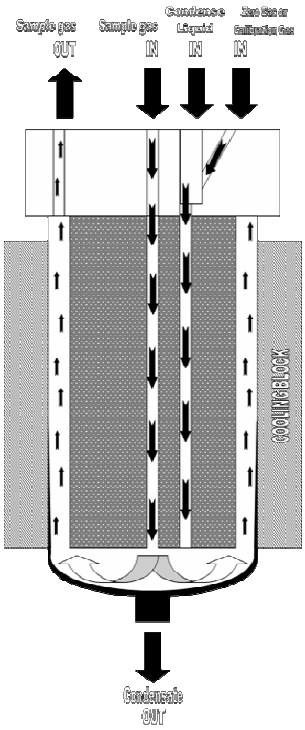
APS 007	Option for APS/ASS 3xx with digital regulation unit ATC 600 (max 10A) for heated line integrated in APS 3xx. Incl. connector and wiring
APS 008	Option for APS/ASS 3xx with 3-way ball-valve integrated in the gas inlet
APS 009	Option for APS/ASS 3xx with 5-way ball-valve integrated in the gas inlet
APS 010	Option for APS/ASS 3xx with adjustable carrying strap
APC 001	Option APS/ASS with complete heat exchanger unit with humidifier and calibration gas inlet. **Only for APS/ASS/ADS series 30x.** Connections: gas in: G1/4", gas out: G1/4", calibration gas in: G1/4", condensate in: G3/8". Material for APC 301: glass, PVDF, PTFE. Material for APC 302: PVDF, PTFE. Incl. Thermal conductivity paste, 5gr



This special heat exchanger is suitable for calibration under perfect conditions. The principle is that zero and calibration gas is injected in the special head of this exchanger where they will be 'humidified' with the return of liquid condensate (See Figure 7). This way the calibration or zero gas will be at the same dew point as the sampling gas. The heat exchanger with humidifier is one to one interchangeable with the standard heat exchanger.

Figure 2 Exchanger with humidifier

ACP 001	Peristaltic pump ASR25, capacity 0,25l/h, connection DN4/6. Materials: Novoprene®, PVDF. Pressure: 200mbar abs -2,2bar abs., power: 230/115VAC
ACP 020	Set of Novoprene® tube with PVDF connectors for ACP, for tube DN4/6.
ACP 022	Set of Viton® tube with PVDF connectors for ACP, for tube DN 4/7
ACP 023	Set of Acidflex® tube DN3x1 with PVDF connectors for ACP, for tube DN4/6
ACP 032	Set of pressure springs for driver ASR25 (4 Pcs.: 2 left, 2 right)
ACP 034	Driver complete for ASR25 (green chassis + white pulleys + springs)
ACP 035	Contact pulley for ASR25 (2 pcs.)
ACP 037	Conveying belt for ASR25
ACP 039	S-bolt for ASR25
ACP 045	Pump head (black) complete with S-bolt without motor and gear for ASR25 (without driver & conveying belt)
ACP 050	Spring for Novoprene®/Viton®/Acidflex® tubing fixing (2 pcs.)
ACP 500	Complete motor and gear for ASR25 for ACP 001 (5 RPM)

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ACC 150	Heat exchanger outer part for 150Nl/h, with 1 x GL25, material: Duran® glass. Incl. thermal conductivity paste (5gr).
ACC 151	Heat exchanger complete for 150Nl/h. Material: body made of Duran® glass, head made of PTFE. Connections: G 1/4"i + G 1/4"i and 1x G 3/8"i. Incl. thermal conductivity paste (5gr).
ACC 152	Heat exchanger complete for 150Nl/h. Material: body/head: SS316. Connections: G 1/4"i + G 1/4"i and 1x G 3/8"i. Incl. thermal conductivity paste (5gr).
ACC 153	Heat exchanger complete for 150Nl/h. Material: body made of PVDF, head made of PTFE. Connections: G 1/4"i + G 1/4"i and 1x G 3/8"i. Incl. thermal conductivity paste (5gr).
APC 101	Heat exchanger complete for 350Nl/h. Body: Duran® glass, head: PTFE, volume displacer: PVDF. Connections: Gas in: 1x G1/4", gas out 2xG1/4", condensate out: 1x GL25-12mm. Incl. thermal conductivity paste, 5gr
APC 103	Heat exchanger for 350Nl/h. Outer part with 1x GL25, material: Duran® glass. Incl. thermal conductivity paste, 5gr
APC 102	Heat exchanger complete for 350Nl/h. Body: PVDF, head: PTFE. Connections: Gas in: 1x G1/4", gas out 2xG1/4", condensate out: 1x G3/8". Incl. thermal conductivity paste, 5gr
APC 104	Heat exchanger for 350Nl/h. Outer part, material: PVDF. Incl. thermal conductivity paste,, 5gr
APC 106	Heat exchanger for 350Nl/h. Inner part, material: PVDF
APC 110	Heat exchanger complete for 350Nl/h. Material: body/head: SS316. Connections: Gas in: 1x G1/4", gas out 2xG1/4", condensate out: 1x G3/8". Incl. thermal conductivity paste, 5gr
APC 112	Heat exchanger for 350Nl/h. Outer part, material: SS316. Incl. thermal conductivity paste, 5gr
APC 114	Heat exchanger for 350Nl/h. Inner part, material: SS316
APC 113	Tent/wick for humidifier of heat exchanger
APC 120	Thermal conductivity paste -40 to +150°C, 5g
APC 121	Thermal conductivity paste -40 to +150°C, 50g
APC 130	Power transistor for APC 3xx series
APC 132	Temperature sensor PT100 for APC 3xx series
APC 133	Peltier element for APC 3xx series. Incl. thermal conductivity paste, -20 - +140°C, 5gr
APC 140	Power supply for APC 3xx series
APC 142	Insulation set for APC 3xx series
APC 143	Electronic controller 110/240VAC for APC 3xx series
APC 144	Electronic controller 110/240VAC for APC 3xx series, with RS485 interface
APC 136	Fan for APC 3xx series
APC 123	Fine fuse 1AT (5 pc.) for APC 3xx series

AUF 301	Extra charge for liquid alarm sensor type ALA 001 mounted to universal filter with glass-body (GL25). Incl. rail-mounting electronics type ALA 101, 230VAC. Max. 3 bar a
AUF 303	Extra charge for liquid alarm sensor type ALA 002 mounted to universal filter with glass-body (GL25). Incl. rail-mounting electronics type ALA 102, 230VAC. Max. 3 bar a
APC 021	Connector for optical liquid-alarm sensor ALS 001 connected to digital controller, with 1 contact NO

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AMP 11E	Analytical diaphragm pump AMP 11E. material: membrane: PTFE-coated, head: PPS, valves: FFPM, capacity: 11Nl/min @ atm. pressure. Connections: G 1/8"i, IP00. 230V
AMP 002	FPM (Viton®) valve and sealing ring for AMP 11E (2 pcs./pump needed)
AMP 003	Diaphragm for AMP 11E, material: PTFE-coated
AMP 004	Valve and sealing ring for AMP 11E, material: FFPM (Kalrez®) (2 pcs./pump needed)
AMP 26P	Analytical diaphragm pump AMP 26P, material: membrane: PTFE-coated, head: Ryton, o-rings & valves: FFPM (Kalrez®). Capacity: 5,5Nl/min @ atm. pressure. Connections: G1/8"i, IP00. 230V
AMP 603	Diaphragm for AMP 26P, material: PTFE-coated
AMP 605	Valve plate for AMP 26P, material: FFPM (Kalrez®) (2 pcs./pump needed)
AMP 604	Sealing ring for AMP 26P, material: FFPM (Kalrez®) (2 pcs./pump needed)
AUF 102	AUF-1-P-GO-T02-MB. Universal filter with filter head and filter element holder made of PTFE. Filter body made of Duran® glass. Filter element made of PTFE with a porosity of 2µm, length 75mm. Gas in-/out connection: G1/4". Incl. bracket for wall-mounting
AUF 104	AUF-1-P-GL-T02-MB. Universal filter with filter head and filter element holder made of PTFE. Filter body made of Duran® glass, with connection GL25 for condensate outlet or liquid alarm sensor. Filter element made of PTFE with a porosity of 2µm, length 75mm. Gas in-/out connection: G1/4". Incl.: bracket for wall-mounting, Union nut GL 25/15 (ACF 750), PTFE sealing ring GL 25-12 mm (ACF 763)
AUF 132	AUF-1-P-GO-G0.1-MB. Universal filter with filter head and filter element holder made of PTFE. Filter body made of Duran® glass. Filter element made of glass-fibre with a porosity of 0.1µm, Gas in-/out connection: G1/4". Incl. bracket for wall-mounting
AUF 134	AUF-1-P-GL-G.1-MB. Universal filter with filter head and filter element holder made of PTFE. Filter body made of Duran® glass, with connection GL25 for condensate outlet or liquid alarm sensor. Filter element made of glass-fibre with a porosity of 0.1µm, length 75mm. Gas in-/out connection: G1/4". Incl.: bracket for wall-mounting, Union nut GL 25/15 (ACF 750), PTFE sealing ring GL 25-12 mm (ACF 763)
AUF 001	Filter element, material: PTFE, length: 75mm, porosity: 2µm
AUF 002	Filter element, material: PTFE, length: 75mm, porosity: 20µm
AUF 006	Filter element, material: SS316, length: 75mm, porosity: 2µm
AUF 007	Filter element, material: SS316, length: 75mm, porosity: 3µm
AUF 008	Filter element, material: SS316, length: 75mm, porosity: 20µm
AUF 012	Filter element, material: ceramics, length: 75mm, porosity: 2µm
AUF 014	Filter element, material: ceramics, length: 75mm, porosity: 20µm
AUF 030	Filter element, material: glass fibre, length: 75mm, porosity: 2µm (pack of 25pcs.)
AUF 801	Filter Glass for filter elements 75mm without drain outlet (Glass only)
AUF 802	Filter Glass for filter elements 75mm with drain outlet (Glass only)
AUF 900	Filter element holder for standard filter elements of 75mm, material: PVDF
AUF 904	O–Ring for filter head, material: Viton®
AUF 905	Filter head, material: PTFE. Incl.: O-ring, mounting bracket
AUF 906	O–Ring for filter element AUF 091 / AUF 092. Material: Viton®
ASP 081	Gasket for filter element, material: Viton®
APS 900	Pre-filter with filter element, porosity: 25µm

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K. Receipt and storage of goods

The device is a complete pre-installed unit.

The arrived goods should be carefully unpacked as soon as possible in order to control the good and correct condition.

The goods and the delivery note should be compared. If any difference is noted please contact your Ankersmid Sampling contact person.

The delivery should be checked for any transport damage. If any anomaly is noted, please contact the transport insurer immediately notifying of the damage.

The goods should be stored in a frost-protected area.

L. Preparation for installation

The safety rules and regulations for the prevention of accidents must be observed when carrying out the installation.

NOTE
Especially the information in chapter D. "Safety instructions" must be applied.

This device is to be used in only in VERTICAL position. The device is operating with open and closed lid, but we recommend to always keep the housing closed in order to protect the products inside.

The device should be placed in a ventilated area, away from heat sources and magnetic fields. If the equipment is placed outside, beware that it is prevented against rain, dust, frost, and direct sunlight.

IMPORTANT
A standard version of the device is not an explosion-proofed apparatus!

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L.1 Mechanical connection

Sample gas inlet	Connecting adapter flange with integrated bending protection for rigid mountage of heated sample lines, including fitting and nut. Material: SS316
Sample gas outlet	Bulkhead union DN4/6. Material: PVDF
Calibration gas, zero gas inlet (Optional)	Bulkhead union DN4/6. Material: PVDF
Condensate outlet	Bulkhead union DN4/6. Material: PVDF

NOTE

The gas inlet and outlet is located inside the portable housing in the heated area. It is important to not mix connections. Ensure that the connections are sealed correctly.
To ensure free removal of condensate, please ensure that the diameter of the tubing for condensate removal it minimum DN4/6mm!
To grant a functional and proper mounting we recommend the use of union pieces with taper pipe and thread type R according to DIN 2999/1 in connection with suitable sealing tape.

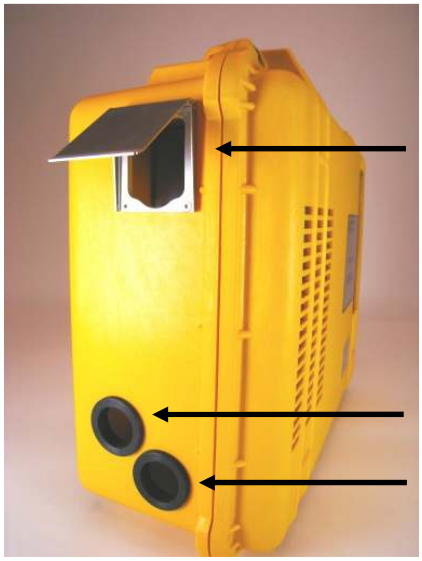

Figure 3 Outside connections

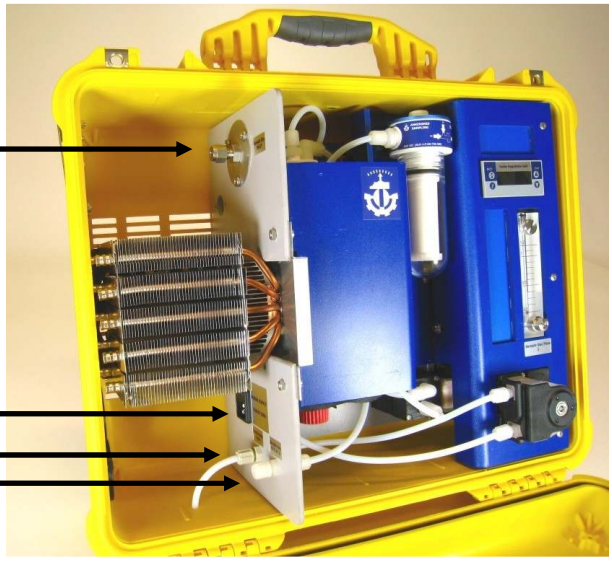

Figure 4 Inside connections

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L.2 Electrical connection

NOTE

At connecting the equipment please check that the supply voltage is identical with the information provided on the type plate.
Attention must be paid to the requirements of IEC 364 (DIN VDE0100) when setting high-power electrical units with nominal voltages of up to 1000V, together with the associated standards and stipulations.

Power supply: 230VAC standard (115VAC on request)

M. Mounting

The conditioning system could be used in portable and stationary conditions and with correct selection of the installation point and proper installation. When used and properly installed in the prescript area ANKERSMID SAMPLING guarantee a long-time of maintenance-free and satisfaction use.

N. Maintenance

Before the maintenance it is necessary that the specific safety procedures regarding the system and operational process are observed.

NOTE

It is necessary to switch off the power supply before any assembly, maintenance or repair work is carried out!

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N.1 Changing the pump hose

When the condensate pump is operated for a long time, the pump hose eventually wears out Condensate may leak from the pump hose. In this case, the pump hose must be replaced immediately as there is a risk of external air being sucked from porous points, which may lead to false readings. We recommend replacement of the pump hose after every 3 months as a precautionary measure. Follow the simple guidelines for handling the condensate before and while changing the condensate tube. The device must be switched off before changing the condensate tubes. Hose connection bolted joints must be loosened and hoses must be disconnected.

NOTE Condensate may leak

The lock of the pump hose must then be rotated clockwise till the bearing surface can be dismantled. After dismantling the bearing surface, the pump hose can be disconnected from it along with the hose connection bolted joints. The new pump hose must then be inserted into the bearing surface. The bearing surface of the condensate pump must be mounted again and the lock must be rotated anti-clockwise in order to fix the bearing surface. Condensate lines must be connected again after locking the bearing surface.

N.2 Replacing the Teflon filter cartridge (optional)

Cartridge of the filter must be replaced in case of contamination. The sample gas pump must be switched off before changing it. The clamping nut of the filter casing can then be removed.

NOTE the filter glass may fall out of the clamping nut

After unscrewing the filter element holder the filter cartridge can be replaced by taking it out and inserting a new one in.

O. Closing down

NOTE

The area in which the device is placed when not in use must be kept free of frost at all times. If the device unit is putting out of action for a short time no particular measures need to be taken.

We recommended sweeping the device with inert gas or ambient air while the unit is putting out of action for a longer time. Condensate has to be removed completely from the cooler.

NOTE

Aggressive condensate is possible. Wear protective glasses and proper protective clothing!

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